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(54) **Reactive probe chip, composite substrate and method for fabrication of the same**

(57) A reaction probe chip which is prepared by loading a reactive probe on fine pieces of carrier such as particles, tile-like plates and then arraying and immobilizing the reactive probe-loaded carrier on a base material. The carrier fine pieces such as particles, tile-like plates and the like are porous or have a reactive surface, and the base material is preferably a thin inorganic plate or a thin organic plate is disclosed.

The inorganic base material is preferably a glass slide or silicon wafer, and the organic base material is preferably a polyester film or polyethylene film. In case the porous carrier pieces are used, the reactivity of the

inner surfaces of the porous carrier pores should be maintained during array or immobilization process of the reactive probe-loaded carrier.

A composite substrate characterized in that on at least a section of the surface thereof, a plurality of porous regions are orderly arranged as compartments by non-porous regions, or a plurality of non-porous regions are orderly arranged as compartments by porous regions is also disclosed. The porous solid is preferably porous glass or porous ceramic, the porous glass is preferably split-phase porous glass, and the surface is preferably flattened by a process such as polishing.

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## EUROPEAN SEARCH REPORT

Application Number  
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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 5 968 728 A (REBER WILLIAM L ET AL) 19 October 1999 (1999-10-19) * column 4, paragraph 2 - paragraph 5; claim 1 *	1-31	G01N33/543 G01N33/546 C12Q1/68 C12Q1/00 G01N33/552 G01N33/544
X	EP 0 468 585 A (EASTMAN KODAK CO) 29 January 1992 (1992-01-29) * page 8, line 8 - page 10, line 20 *	1-31	
X	US 5 830 767 A (BAUMAN DAVID S ET AL) 3 November 1998 (1998-11-03) * column 5, line 49 - column 26, line 8 *	1-31	
X	EP 0 895 083 A (CANON KK) 3 February 1999 (1999-02-03) * column 4, line 27 - column 10, line 58; claims 1,6 *	1-31	
X	PATENT ABSTRACTS OF JAPAN vol. 1997, no. 11, 28 November 1997 (1997-11-28) & JP 09 178753 A (FUNAYAMA MASASHI), 11 July 1997 (1997-07-11) * abstract *	1-9,26	TECHNICAL FIELDS SEARCHED (Int.Cl.7)  G01N C12Q B01J
X	PATENT ABSTRACTS OF JAPAN vol. 1999, no. 13, 30 November 1999 (1999-11-30) & JP 11 211727 A (BOEHRINGER MANNHEIM GMBH), 6 August 1999 (1999-08-06) * abstract *	1-31	
P.X	WO 00 33078 A (SYNTRIX BIOCHIP INC ;ZEBALA JOHN A (US)) 8 June 2000 (2000-06-08) * page 33, line 21 - page 57, line 27 *	1-31	
The present search report has been drawn up for all claims			
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CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document I : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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## EUROPEAN SEARCH REPORT

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EP 01 10 8148

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
P, X	US 6 207 369 B1 (WOHLSTADTER JACOB N ET AL) 27 March 2001 (2001-03-27) * column 11, line 60 - column 18, line 61 * * column 58, line 39 - column 60, line 13 * * column 64, line 14 - line 15 * * column 93, line 41 - line 42 *	1-31	
T	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 24, 11 May 2001 (2001-05-11) & JP 2001 183378 A (FUJI PHOTO FILM CO LTD), 6 July 2001 (2001-07-06) * abstract *	1-9, 26	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
The present search report has been drawn up for all claims			
Place of search <b>THE HAGUE</b>		Date of completion of the search <b>16 November 2001</b>	Examiner <b>Hart-Davis, J</b>
<p><b>CATEGORY OF CITED DOCUMENTS</b></p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention L : earlier patent document, but published on, or after the filing date D : document cited in the application I : document cited for other reasons &amp; : member of the same patent family, corresponding document</p>			

EPC FORM 1533/01 (P/2001)

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 10 8148

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

16-11-2001

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5968728	A	19-10-1999	NONE	
EP 0468585	A	29-01-1992	US 5200315 A AT 130097 T CA 2046130 A1 DE 69114394 D1 DE 69114394 T2 EP 0468585 A2 FI 913574 A IE 912625 A1 JP 3105579 B2 JP 4232862 A US 5330891 A	06-04-1993 15-11-1995 26-01-1992 14-12-1995 15-05-1996 29-01-1992 26-01-1992 29-01-1992 06-11-2000 21-08-1992 19-07-1994
US 5830767	A	03-11-1998	US 5807756 A	15-09-1998
EP 0895083	A	03-02-1999	EP 0895083 A2 JP 11099000 A	03-02-1999 13-04-1999
JP 09178753	A	11-07-1997	NONE	
JP 11211727	A	06-08-1999	DE 19748489 A1 EP 0913690 A2	06-05-1999 06-05-1999
WO 0033078	A	08-06-2000	AU 1745200 A AU 4218499 A WO 9961653 A2 WO 0033078 A1	19-06-2000 13-12-1999 02-12-1999 08-06-2000
US 6207369	B1	27-03-2001	US 6066448 A AU 4649597 A EP 0944820 A1 JP 2001503856 T WO 9812539 A1 US 2001021534 A1 AU 720625 B2 AU 5420596 A BR 9607193 A CA 2213854 A1 CN 1186513 A CZ 9702844 A3 EP 0821726 A1 HU 9801679 A2 JP 11502617 T WO 9628538 A1 US 6140045 A	23-05-2000 14-04-1998 29-09-1999 21-03-2001 26-03-1998 13-09-2001 08-06-2000 02-10-1996 11-11-1997 19-09-1996 01-07-1998 14-10-1998 04-02-1998 28-10-1998 02-03-1999 19-09-1996 31-10-2000

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 01 10 8148

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The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

16-11-2001

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6207369 B1		US 6090545 A	18-07-2000
JP 2001183378 A	06-07-2001	NONE	

EPC FORM P0459

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